Chemistry 129.03 - General Chemistry - Spring 2017

Week #2

Class Meetings:

Monday, January 30. Problem Set #1 due.

General Properties of Solutions. We examine types of solutions and ways to express concentration.

Reading for today: Sections 3.3-3.4

Start our discussion of the greenhouse gases module, we will consider some of the factors affecting the temperature of a planet (Session 1).

Wednesday, February 1. *Session 2 GHG Module: How can we tell the identity of gases on other planets?* Continue our discussion of atomic structure and Bohr's model of the atom.

Reading for today: Sections 2.1-2.3

Friday, February 3. Quiz #1 at the beginning of class (Stoichiometry and Significant Figures).

Finish session 2 of the GHG Module.
How can we tell the identity of gases on other planets? Continue our discussion of atomic structure and Bohr's model of the atom. Demos: Atomic Line Spectra.

Reading for today: Sections 6.1-6.2

Assignment

Problem Set #2 - Due Monday, February 6 (at the beginning of class). Late homework will not be accepted.

1. How many grams of NaCl are needed to prepare 250.0mL of a 0.0475M solution? (b) How many mL of a stock solution of 10.0M HNO_3 would you have to use to prepare 0.450L of 0.500M HNO_3?

Chemistry 129.03 - General Chemistry - Spring 2017

2. Balance the following reaction:

$$HCl_{(aq)} + Ba(OH)_{2(aq)} \rightarrow BaCl_{2\ (aq)} + H_2O_{(l)}$$

What volume of a 0.150M $Ba(OH)_2$ solution is required to completely react with 125mL of 0.150M HCl? What is the concentration of the $BaCl_2$ solution formed?

3. Based on Rutherford's nuclear theory, what does an atom look like?

4. Complete the following table:

Symbol	$^{35}_{17}Cl^{1-}$			$^{33}_{15}P$
Protons		20		
Neutrons			48	
Electrons			36	
Atomic Number			36	
Mass Number		40		
Charge		+2		

5. A typical carbon-carbon bond requires 348kJ/mol to break. What is the longest wavelength of radiation with enough energy to break a carbon-carbon bond? What type of radiation is this?

6. Determine whether each of the following transitions in the hydrogen atom corresponds to absorption or emission of energy:
   a. from n=3 to n=1
   b. orbit of radius 2.12Å to one of 8.46Å
   c. from n=2 to n=4
   d. orbit of radius 4.76Å to one of 0.529Å

7. Using $E_n = -2.18 \times 10^{-18} J \left(\frac{1}{n^2}\right)$, calculate the energy of an electron in the hydrogen atom when n=3 and when n=5. Calculate the wavelength and frequency of the radiation released when an electron moves from n=5 to n=3. What type of radiation is this?